

Accuracy and stability of numerical algorithms

Higham, Nicholas J., 1961- , author

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Abstrak

This second edition expands and updates the coverage of the first edition (1996) and includes numerous improvements to the original material. Two new chapters treat symmetric indefinite systems and skew-symmetric systems, and nonlinear systems and Newton's method. Twelve new sections include coverage of additional error bounds for Gaussian elimination, rank revealing LU factorizations, weighted and constrained least squares problems, and the fused multiply-add operation found on some modern computer architectures.

An expanded treatment of Gaussian elimination incorporates rook pivoting, along with a thorough discussion of the choice of pivoting strategy and the effects of scaling. The book's detailed descriptions of floating point arithmetic and of software issues reflect the fact that IEEE arithmetic is now ubiquitous. Although not designed specifically as a textbook, this new edition is a suitable reference for an advanced course. It can also be used by instructors at all levels as a supplementary text from which to draw examples, historical perspective, statements of results, and exercises. With its thorough indexes and extensive, up-to-date bibliography, the book provides a mine of information in a readily accessible form.